"Frankly those of us in structural engineering see the same mistakes being made time after time."-
Charlie Thornton, NCSTA, Federal Advisor, December 2003.

As Mr. Thornton makes clear above, the need for a thorough investigation into the causes and implications of the WTC disaster and others has never been greater. We believe that in many ways, specific shortcomings in NIST's investigation of the World Trade Center disaster reflect the lack of importance afforded to forensic engineering and the means of implementing any lessons learned in this country. In short, the avoidance of focus on forensic investigation is a problem of major concern.

It is a fact that the most important forensic engineering investigation in history has been assigned to an agency which is highly qualified in research, but which by its own admission has no investigative mandate. The Progress Report on NIST's investigation into the World Trade Center Disaster and other evidence seems to demonstrate that NIST, despite its new mandate under the National Construction Safety Team Act, has made only limited efforts to develop such an investigative capacity.

That is not a comment on the ability of NIST's staff or indeed of structural engineers, fire protection engineers, or life-safety experts in this country – many of whom are genuinely among the best in the world. It is, however, a reflection of the fact that when Congress decided to vote for and fund the biggest forensic engineering investigation ever seen in the United States, there was no existing legislation, no government institution, no protocols, practices or procedures to anchor such a mandate.

Essentially, NIST or perhaps more accurately lawyers within NIST and in the Commerce Department, have filled that vacuum by setting artificial constraints on this investigation from the outset. The outlook was enshrined by the often repeated mantra that NIST was concerned with "fact finding not fault finding." While apparently sufficient in itself, the fact finding, not fault finding formula seems, to date at least, to have limited the lines of inquiry, led to an avoidance of any context, and limited the sources of information. Facts can become probable faults, when judged by law, by code conditions, by prevailing practice – and there are plenty of facts that lend themselves to being interpreted as faults. NIST, however, seems to have avoided, at times, pursuit of facts that carry even the potential to be interpreted as faults. All these limitations will, we fear, limit the scope of the recommendations NIST is due to make as a result of its inquiry. We sincerely hope that this is not the case.

The fact finding not fault finding prescription came from the ethos set by previous NIST investigations. It totally failed to recognize the uniqueness of the World Trade Center investigation, in terms of scale, importance, numbers of deaths and, above all, the unique legislation that established the investigation. The National Construction Safety Team Act set no such limitations on the WTC Investigation.

Legislators and 9/11 families looked to NIST as the institution which most closely matched the needs of the federal government and the relatives of 9/11 victims. In terms of expertise that was true; in terms of investigation and modus operandi it was not. 9/11 family members and individual experts in the field at the time were concerned with the possible problems that this situation could ensue, and fought hard to win subpoena power for the NIST Investigation.

Their concerns at the time were twofold.

First, the Port Authority of New York & New Jersey (PA), claims federal government immunity from the jurisdiction of local authorities regarding building, fire and life-safety codes. This emerged as a critical issue even before the investigation began. It would clearly have to be one area of focus for a credible investigation charged with making recommendations for future standards and procedures as related to codes. The federal government is a beneficiary of such immunities. Could one of its own agencies, NIST, an agency of the Department of Commerce, really be comfortable with recommending the abolition/limitation of such building code immunities whether or not they were a contributing factor to the WTC disaster?

Secondly, the Department of Commerce is an entity with close ties and interests in boosting the construction industry – part of its quite proper role in developing trade and industry in the United States and for US companies overseas. Would such an agency, through NIST, allow recommendations to be made that might be opposed by the construction industry on the grounds of cost? While we recognize that all such government departments have to strike a balance between representing the producer and the consumer, between private cost and public safety, where and when might the line be drawn here? Were restrictions on the scope of the investigation being set so as to limit the scope of recommendations before the investigation was even underway?

Why this is Important:

Buildings and means of transportation are clearly terrorists' weapons of choice. The February 1993 attack on the Twin Towers, the April 1995 bombing of the Alfred P Murrah Building in Oklahoma City and finally the 9/11 attacks in NYC proved this beyond dispute. Britain, Spain, and Israel, among others, have demonstrated in recent years that a reduction in the vulnerability of buildings and means of transportation are now a matter of national security. Construction and

transportation are clearly a major part of our domestic war against terrorism. The main means of scientifically-based research and analysis for reducing our vulnerability at home is credible forensic engineering and the recommendations made to the construction industry, the code developers and the politicians.

This investigation will set the benchmark in the United States. It should not have had to. That should have happened in April 1995 following the bombing of the Alfred P. Murrah building in Oklahoma City. It did not. In the aftermath of the Oklahoma City bombing, when the BPAT team arrived more than three weeks after the event, they were forbidden access to the site and had no resources to do the computer modeling and other basics that would have answered fundamental questions about the collapse sequence. That was a national disgrace. As a result of the failure there, major changes to GSA building requirements – in particular a program to assess progressive collapse potential -- have been devised and implemented without a firm forensic basis for such a program: a flaw that may yet prove fatal if this attracts the terrorists' attention like other vulnerabilities have.

Thus the World Trade Center investigation is a unique if belated opportunity to establish a firm base for forensic engineering in this country – through a separate office, housed within NIST, mandated by the National Construction Safety Team Act. Part of the problem, we believe, is that NIST continues to try and make such work a part of its other tasks, drawing few if any distinctions, trying in one lawyer's words to "make it compatible with the other things we do." We do not believe this is necessary or desirable. NIST should, we believe, aggressively assert itself as the home base for the forensic engineering investigation of construction, fire or egress disasters, using the full powers granted by the legislation. Any thing less will serve as a betrayal of public safety and the more than 2,700 souls killed in New York on September 11, 2001.

Recommendations for the final WTC report:.

1. There must be more specificity – the sources NIST cites should be quoted by date, title and authorship. Cited documents should also be published in annexes to allow the full context to be understood by the reader.

2. Secondary sources. In many cases NIST has no documentary evidence – documents, plans, letters & memos have been disposed of or were destroyed in the 9/11 attacks. Yet many of these documents are in the hands of secondary sources, some in the private hands of retired individuals. We must be sure that NIST has pursued all these sources in some critical areas

3. Interviews are essential. Many of those who made crucial decisions on the design, construction and maintenance of these buildings are available for interviews. Often their evidence bridges vital gaps left by the absence of documentation or indeed adds vital context. We see little evidence that NIST has done any investigative interviews of this nature, the like of which have appeared in numerous press reports and books. We believe interviews are an essential ingredient and tool.

4. Narrative is essential. The progress report is all too often a series of sections following a series of headings referring to project tasks and progress, driven by dry statements of fact. There is no investigative narrative built around the investigation objectives and key questions that NIST has designated. This is not solely a technical investigation – the questions and answers are linked by the story of how these buildings were designed, engineered, constructed and maintained. Just as there needs to be a narrative coherence within each project, so there needs to be the same between each project. At the very least, a narrative overview, perhaps part of the Executive Summary, needs to accompany any final report. In this way, both the families of the victims, as well as the general public, will be satisfied that this organization has done an acceptable and credible job in the investigation of the collapse of the WTC on 9/11/01, and the protection of public safety in the future.